MC 87-I-37B(P)

PRELIMINARY REPORT
INDUSTRY SERIES

1987
Census of Manufactures
MC87-I-37B(P)
Issued June 1989

AEROSPACE EQUIPMENT, INCLUDING PARTS

Industries 3721, 3724, 3728, 3761, 3764, and 3769

INTRODUCTION

This report presents preliminary statistics from the 1987 Census of Manufactures for those establishments classified in the industries listed above. These data will be superseded by a more comprehensive final paperbound report. The method of data collection and use of administrative data are discussed in detail in the appendix.

All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The definitions of these industries are the same as those used in the 1987 Standard Industrial Classification (SIC) Manual.[1]

INDUSTRY 3721, AIRCRAFT

In the 1987 Census of Manufactures, Industry 3721, Aircraft, had employment of 276.2 thousand. The employment figure was less than 1 percent above the 275.1 thousand reported in 1982. Compared with 1986, employment in 1987 increased 8 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The total value of shipments for establishments classified in this industry was $40.0 billion. The products primary to this industry appear in table 2 and aggregated to $36.7 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to $23.8 billion in 1987. Data on specific materials consumed appear in table 3.

INDUSTRY 3724, AIRCRAFT ENGINES AND ENGINE PARTS

In the 1987 Census of Manufactures, Industry 3724, Aircraft Engines and Engine Parts, had employment of 139.3 thousand. The employment figure was 6 percent above the 130.7 thousand reported in 1982. Compared with 1986, employment in 1987 increased 9 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The total value of shipments for establishments classified in this industry was $20.2 billion. The products primary to this industry appear in table 2 and aggregated to $18.6 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to $9.0 billion in 1987. Data on specific materials consumed appear in table 3.

INDUSTRY 3728, AIRCRAFT PARTS AND EQUIPMENT, N.E.C.

In the 1987 Census of Manufactures, Industry 3728, Aircraft Parts and Equipment, N.E.C., had employment of 187.5 thousand. The employment figure was 41 percent above the 132.8 thousand reported in 1982.

The total value of shipments for establishments classified in this industry was $17.9 billion. The products primary to this industry appear in table 2 and aggregated to $19.7 billion in 1987.

[1] **Standard Industrial Classification Manual: 1987.** For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-00314-2.

Address inquiries to Bureau of the Census, Industry Division, Washington, DC 20233, or call **Brandy Yarbrough** (301) 763-7304.

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The cost of materials and services used by establishments in this industry amounted to $6.5 billion in 1987. Data on specific materials consumed appear in table 3.

INDUSTRY 3761, GUIDED MISSILES AND SPACE VEHICLES

In the 1987 Census of Manufactures, Industry 3761, Guided Missiles and Space Vehicles, had employment of 166.7 thousand. The employment figure was 67 percent above the 99.6 thousand reported in 1982. Compared with 1986, employment in 1987 decreased 4 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The total value of shipments for establishments classified in this industry was $21.6 billion. The products primary to this industry appear in table 2 and aggregated to $16.0 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to $6.8 billion in 1987. Data on specific materials consumed appear in table 3.

INDUSTRY 3764, SPACE PROPULSION UNITS AND PARTS

In the 1987 Census of Manufactures, Industry 3764, Space Propulsion Units and Parts, had employment of 31.8 thousand. The employment figure was 26 percent above the 25.3 thousand reported in 1982. Compared with 1986, employment in 1987 increased 1 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The total value of shipments for establishments classified in this industry was $3.5 billion. The products primary to this industry appear in table 2 and aggregated to $3.5 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to $1.3 billion in 1987. Data on specific materials consumed appear in table 3.

INDUSTRY 3769, SPACE VEHICLE EQUIPMENT, N.E.C.

In the 1987 Census of Manufactures, Industry 3769, Space Vehicle Equipment, N.E.C., had employment of 14.8 thousand. The employment figure was 31 percent below the 21.4 thousand reported in 1982. Compared with 1986, employment in 1987 decreased 32 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The total value of shipments for establishments classified in this industry was $1.1 billion. The products primary to this industry appear in table 2 and aggregated to $3.4 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to $304.0 million in 1987. Data on specific materials consumed appear in table 3.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in the tables in this publication:

-	Represents zero.
(D)	Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
(NA)	Not available.
(NC)	Not comparable.
(S)	Withheld because estimate did not meet publication standards on the basis of either the response rate or a consistency review.
(X)	Not applicable.
(Z)	Less than half the unit shown.
do	Ditto.
n.e.c.	Not elsewhere classified.
n.s.k.	Not specified by kind.
pt.	Part.
r	Revised.
SIC	Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

CONTACTS FOR DATA USERS

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Import/Export Publications	Foreign Trade Division	(301) 763-5140
Industry Analysis and Forecasts	International Trade Administration	(202) 377-4356

Table 1. Historical Statistics for the Industry: 1987 and Earlier Years

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendix.]

Year[1]	Companies[2] (no.)	All establishments[3] Total (no.)	All establishments[3] With 20 employees or more (no.)	All employees Number (1,000)	All employees Payroll (million dollars)	Production workers Number (1,000)	Production workers Hours (millions)	Production workers Wages (million dollars)	Value added by manufacture[4] (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories[4] (million dollars)	Ratios Specialization (percent)	Ratios Coverage (percent)
INDUSTRY 3721, AIRCRAFT															
1987 Census	(NA)	154	80	276.2	9 949.1	146.2	291.2	4 447.3	16 746.7	23 765.5	40 037.8	1 181.6	19 815.9	(NA)	(NA)
1986 ASM	(NA)	(NA)	(NA)	256.7	8 983.9	135.3	269.5	3 964.3	15 160.7	22 167.9	38 184.3	1 108.2	18 686.5	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	241.8	8 006.8	121.9	238.6	3 482.5	17 096.3	17 482.1	34 976.5	1 013.3	19 028.6	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	232.5	7 456.9	115.5	228.2	3 206.4	15 498.2	15 577.2	28 453.2	860.8	19 547.2	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	250.9	7 562.0	120.6	238.9	3 248.9	14 012.5	14 910.0	30 522.0	621.8	17 869.2	(NA)	(NA)
1982 Census	139	165	86	275.1	7 743.7	138.6	272.2	3 517.9	15 641.9	15 705.4	28 024.3	836.4	19 143.9	87	97
1981 ASM	(NA)	(NA)	(NA)	301.1	7 954.8	156.5	312.0	3 615.6	15 488.8	15 651.8	29 832.8	736.1	15 195.6	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	281.1	6 667.4	155.0	310.0	3 144.0	14 601.6	14 642.1	26 782.4	687.6	12 974.0	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	273.4	5 723.4	154.2	310.3	2 807.2	12 173.5	12 382.2	22 521.7	604.1	10 071.3	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	237.7	4 756.2	134.7	267.7	2 244.4	9 120.5	8 754.5	17 052.1	351.9	7 756.0	(NA)	(NA)
1977 Census	151	176	74	222.7	3 975.9	119.0	232.7	1 765.2	8 134.1	6 742.7	14 834.2	202.4	6 616.5	83	98
1976 ASM	(NA)	(NA)	(NA)	208.7	3 563.0	116.3	230.1	1 633.1	6 823.3	6 101.7	13 419.3	150.4	5 308.5	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	219.9	3 439.1	122.3	244.8	1 559.5	7 015.7	5 742.5	12 202.5	123.0	6 822.1	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	238.7	3 298.4	137.6	268.3	1 567.5	6 972.3	5 183.8	11 665.4	111.0	6 155.3	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	238.5	3 059.4	137.6	265.7	1 453.3	6 635.4	4 700.1	10 666.0	119.9	5 419.9	(NA)	(NA)
1972 Census	141	168	86	231.8	2 867.1	131.0	259.1	1 332.3	5 083.0	4 028.7	8 779.3	57.1	6 375.3	86	96
INDUSTRY 3724, AIRCRAFT ENGINES AND ENGINE PARTS															
1987 Census	(NA)	447	286	139.3	4 802.4	79.6	165.7	2 355.6	11 977.3	9 078.7	20 220.9	745.5	6 460.0	(NA)	(NA)
1986 ASM	(NA)	(NA)	(NA)	121.5	4 388.2	74.7	156.9	2 174.0	10 791.1	7 960.9	18 214.2	857.6	5 704.5	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	118.6	3 984.2	70.3	145.8	1 955.0	8 462.1	7 107.3	15 389.9	692.0	5 106.7	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	109.1	3 388.3	64.0	134.5	1 668.9	7 824.7	6 205.2	13 659.2	632.7	4 384.6	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	122.0	3 546.4	69.5	142.1	1 816.9	7 720.2	6 204.5	14 112.0	440.2	4 414.1	(NA)	(NA)
1982 Census	281	340	225	130.7	3 544.4	76.5	154.0	1 819.3	7 572.2	6 262.1	13 809.3	441.1	4 691.6	85	96
1981 ASM	(NA)	(NA)	(NA)	140.0	3 562.8	82.9	164.2	1 887.6	6 890.9	6 980.9	13 777.4	504.6	4 101.8	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	140.6	3 216.5	85.3	174.2	1 723.7	6 957.7	5 734.0	12 027.7	460.1	3 769.0	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	134.8	2 823.7	81.3	170.7	1 518.1	5 991.3	4 374.8	9 662.4	383.1	2 835.5	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	115.7	2 305.4	69.6	145.6	1 182.9	4 438.9	3 508.8	7 510.1	266.2	1 947.1	(NA)	(NA)
1977 Census	226	269	177	106.1	1 939.4	62.4	128.7	970.0	3 599.1	2 761.8	6 272.3	174.9	1 440.2	81	95
1976 ASM	(NA)	(NA)	(NA)	99.3	1 629.5	57.0	115.4	788.2	3 126.2	2 477.9	5 634.4	185.1	1 210.4	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	108.0	1 630.5	61.9	130.3	814.0	2 989.8	2 440.9	5 346.4	150.1	1 303.9	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	115.9	1 603.3	67.9	142.5	801.2	2 965.8	2 108.4	4 880.9	104.9	1 238.3	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	114.0	1 455.4	67.3	139.2	721.9	2 605.2	1 895.2	4 399.8	87.2	1 016.1	(NA)	(NA)
1972 Census	189	20[illegible]	156	104.7	1 256.8	60.4	125.0	603.4	1 991.7	1 742.1	3 640.2	73.0	868.2	87	94
INDUSTRY 3728, AIRCRAFT PARTS AND EQUIPMENT, N.E.C.															
1987 Census	(NA)	982	466	187.5	6 083.4	103.5	217.3	3 001.0	11 737.4	6 481.0	17 862.4	733.2	6 093.7	(NA)	(NA)
1986 ASM	(NA)	(NA)	(NA)	186.4	5 972.3	105.2	216.9	2 955.9	11 804.2	6 312.6	17 904.6	851.9	5 826.5	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	167.8	5 175.9	96.1	202.0	2 637.2	10 239.9	5 872.7	15 691.6	723.3	5 689.5	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	175.2	5 244.8	93.9	195.2	2 474.5	10 257.1	6 528.5	16 217.7	597.1	6 132.0	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	154.1	4 342.1	82.9	166.1	2 041.9	8 366.3	5 441.4	13 477.3	467.9	4 688.4	(NA)	(NA)
1982 Census	912	966	419	132.8	3 429.4	73.5	146.6	1 650.0	6 188.1	3 989.0	10 193.1	402.9	3 805.7	71	65
1981 ASM	(NA)	(NA)	(NA)	140.3	3 252.8	84.2	173.5	1 740.0	5 716.0	3 473.7	8 871.4	396.3	3 349.6	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	158.9	3 409.5	94.9	193.3	1 797.4	6 062.6	4 016.2	9 229.3	469.8	3 572.7	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	137.5	2 640.4	84.0	169.1	1 400.6	4 740.7	3 010.8	7 224.3	313.6	2 363.4	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	110.2	2 016.6	64.2	126.5	995.2	3 540.2	2 141.3	5 414.5	156.5	1 563.2	(NA)	(NA)
1977 Census	681	728	298	102.0	1 705.2	58.7	113.7	826.3	2 998.4	1 747.7	4 760.6	131.1	1 243.1	72	57
1976 ASM	(NA)	(NA)	(NA)	100.0	1 472.5	63.9	126.6	863.3	2 785.4	1 507.4	4 409.3	95.6	1 329.3	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	110.2	1 5[illegible]3	71.4	148.3	921.6	2 795.7	1 656.1	4 445.4	95.7	1 466.9	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	107.4	1 381.6	72.1	151.4	857.4	2 521.8	1 536.1	3 892.9	67.1	1 470.4	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	106.3	1 269.8	70.8	145.3	755.0	2 219.3	1 318.3	3 466.7	51.1	1 270.1	(NA)	(NA)
1972 Census	649	694	313	102.2	1 158.1	68.1	139.5	677.9	2 048.9	1 064.0	3 071.9	38.9	1 177.2	77	66
INDUSTRY 3761, GUIDED MISSILES AND SPACE VEHICLES															
1987 Census	(NA)	40	38	166.7	6 414.8	62.7	121.4	2 019.7	14 999.5	6 791.3	21 565.8	818.7	6 323.3	(NA)	(NA)
1986 ASM	(NA)	(NA)	(NA)	174.2	6 301.1	63.5	122.9	1 931.6	14 120.6	7 226.8	21 401.3	977.7	5 596.6	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	154.3	5 473.3	53.4	105.8	1 491.7	12 576.7	6 096.7	18 087.1	968.8	5 471.1	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	120.9	4 118.8	43.7	86.6	1 202.8	10 047.0	4 205.6	13 191.5	686.3	3 782.4	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	110.7	3 469.3	42.7	80.5	1 116.0	8 260.8	4 068.5	11 870.6	437.6	2 306.6	(NA)	(NA)
1982 Census	16	29	28	99.5	3 159.4	35.9	70.5	915.7	7 025.5	3 652.1	10 218.6	293.3	1 685.3	83	86
1981 ASM	(NA)	(NA)	(NA)	106.5	3 082.0	33.8	65.4	795.3	6 092.7	2 853.5	8 873.2	255.0	1 244.2	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	106.5	2 890.5	36.6	75.1	800.8	5 822.9	2 725.4	8 265.9	234.4	1 189.4	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	104.6	2 566.2	39.8	77.7	788.9	5 046.0	2 280.4	7 119.7	195.3	968.8	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	93.8	2 122.2	33.4	65.5	623.3	4 176.6	1 677.2	5 990.2	135.3	673.3	(NA)	(NA)
1977 Census	20	40	37	94.0	1 931.5	35.2	67.0	603.8	3 564.8	1 691.3	5 314.4	125.6	600.2	87	91
1976 ASM	(NA)	(NA)	(NA)	106.2	2 093.1	38.8	76.0	633.5	3 885.6	1 865.5	5 521.4	88.3	684.3	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	110.8	2 017.0	41.4	80.1	650.0	3 687.8	1 955.1	5 503.2	85.4	654.6	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	116.9	1 941.7	44.0	87.0	603.9	3 326.7	1 963.7	5 279.2	66.8	491.8	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	117.3	1 840.0	44.6	85.5	577.1	3 176.0	1 494.5	4 698.2	78.4	451.0	(NA)	(NA)
1972 Census	22	70	57	116.4	1 751.7	47.6	91.5	575.9	2 948.7	1 166.3	4 123.6	62.9	463.0	89	95
INDUSTRY 3764, SPACE PROPULSION UNITS AND PARTS															
1987 Census	(NA)	35	28	31.8	1 174.	11.2	22.4	350.0	2 314.2	1 286.1	3 537.1	194.4	473.9	(NA)	(NA)
1986 ASM	(NA)	(NA)	(NA)	31.4	1 089.6	11.2	22.3	340.1	1 974.1	1 200.2	3 125.1	280.4	404.6	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	29.8	1 034.2	11.3	24.5	339.9	1 879.7	1 205.6	3 110.0	233.5	349.5	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	28.2	902.3	11.7	25.5	307.2	1 853.9	965.6	2 802.7	148.2	303.0	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	27.6	848.8	11.7	23.8	306.0	1 694.1	887.8	2 577.3	106.1	304.1	(NA)	(NA)
1982 Census	20	27	25	25.3	737.1	10.8	23.4	263.1	1 534.0	737.2	2 221.2	95.8	276.0	89	89
1981 ASM	(NA)	(NA)	(NA)	26.7	699.8	10.7	23.0	239.3	1 338.8	647.4	1 959.8	73.4	200.5	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	25.5	607.3	10.8	22.6	220.4	1 150.1	540.6	1 652.7	60.4	171.5	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	22.2	493.4	9.6	20.5	169.2	856.5	411.9	1 277.6	43.7	134.2	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	20.1	414.1	8.4	17.5	140.1	764.2	343.2	1 113.8	27.6	140.2	(NA)	(NA)

See footnotes at end of table.

Table 1. Historical Statistics for the Industry: 1987 and Earlier Years—Con.

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendix.]

Year[1]	Companies[2] (no.)	All establishments[3] Total (no.)	All establishments[3] With 20 employees or more (no.)	All employees Number (1,000)	All employees Payroll (million dollars)	Production workers Number (1,000)	Production workers Hours (millions)	Production workers Wages (million dollars)	Value added by manufacture[4] (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories[4] (million dollars)	Ratios Specialization (percent)	Ratios Coverage (percent)
INDUSTRY 3764, SPACE PROPULSION UNITS AND PARTS—Con.															
1977 Census	18	25	24	18.6	356.6	7.1	14.9	111.5	620.7	316.4	945.5	25.3	167.5	92	88
1976 ASM	(NA)	(NA)	(NA)	19.0	334.2	7.1	15.2	104.1	582.7	272.3	862.9	20.2	167.7	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	20.5	335.0	7.9	16.6	105.7	579.6	323.4	901.7	14.6	179.4	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	21.0	314.7	8.5	17.1	99.0	587.8	313.5	888.9	21.3	175.7	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	22.5	315.5	8.7	18.2	99.1	607.5	320.9	948.9	16.0	167.8	(NA)	(NA)
1972 Census	22	29	28	20.8	276.2	8.1	17.3	87.6	506.6	220.7	716.3	18.4	174.2	91	87
INDUSTRY 3769, SPACE VEHICLE EQUIPMENT, N.E.C.															
1987 Census	(NA)	81	47	14.8	511.5	8.0	15.5	236.8	838.3	304.0	1 142.5	63.4	131.8	(NA)	(NA)
1986 ASM	(NA)	(NA)	(NA)	22.1	763.5	10.4	20.6	290.1	1 686.6	519.3	2 169.7	68.7	212.1	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	33.7	1 141.8	19.3	39.1	586.1	2 652.0	936.3	3 539.8	153.3	292.7	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	26.7	905.6	15.5	34.1	463.1	2 737.5	836.2	3 502.0	125.0	245.9	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	24.4	735.4	13.5	27.7	353.2	1 728.3	579.1	2 264.0	85.0	171.2	(NA)	(NA)
1982 Census	45	49	33	21.4	584.6	13.0	26.2	304.5	1 297.1	645.1	1 958.3	72.4	120.4	62	46
1981 ASM	(NA)	(NA)	(NA)	17.9	437.1	9.3	22.0	224.3	992.6	533.1	1 522.0	40.1	88.5	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	8.7	200.6	4.4	8.9	79.3	351.3	177.5	525.3	10.7	35.1	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	9.5	188.6	5.3	10.6	78.7	309.7	146.1	453.3	10.7	27.7	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	8.2	163.3	4.2	8.5	63.5	225.7	143.3	370.6	10.7	27.7	(NA)	(NA)
1977 Census	41	42	25	7.2	139.2	3.9	8.3	55.3	236.3	110.1	339.4	13.3	29.8	85	(D)
1976 ASM	(NA)	(NA)	(NA)	16.5	295.5	6.7	14.1	90.5	558.4	209.2	757.3	17.5	80.7	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	16.3	272.3	7.0	14.4	93.0	496.5	180.5	655.6	9.2	71.8	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	16.5	243.4	7.4	15.6	88.8	400.1	192.4	595.0	15.6	93.0	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	20.2	278.7	7.6	15.6	85.1	499.5	270.7	766.0	9.6	96.4	(NA)	(NA)
1972 Census	45	48	39	20.9	289.3	7.9	16.9	83.3	513.9	286.3	788.2	11.0	91.2	79	68

Note: Establishments of single unit companies with up to 20 employees (cutoff varied by industry) were excluded from the mail portion of the census. Data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were estimated based on administrative-record information from other agencies in conjunction with industry averages. These establishments accounted for the following percent of total value of shipments: SIC 3721, 1%; SIC 3724, 1%; SIC 3728, 3%; SIC 3761, 1%; SIC 3764, 1%; and SIC 3769, 3%.

[1]In annual survey of manufactures (ASM) years, data are estimates based on a representative sample of establishments canvassed annually and may differ from results of a complete canvass of all establishments. ASM publication shows percentage standard errors. Unless otherwise noted, for data prior to 1972, see 1972 Census of Manufactures, vol. II, table 1a of the Industry chapter.

[2]For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

[3]Includes establishments with payroll at any time during year.

[4]Beginning with the 1982 Census of Manufactures, all respondents were requested to report their inventories at (the lower of) cost or market prior to adjustment to LIFO cost. This is a change from prior Censuses and annual surveys of manufactures in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, inventories and value added by manufacture are not comparable to prior-year data.

Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987 Number of companies with shipments of $100,000 or more	1987 Product shipments[1] Quantity[2]	1987 Product shipments[1] Value (million dollars)	1982 Number of companies with shipments of $100,000 or more	1982 Product shipments[1] Quantity[2]	1982 Product shipments[1] Value (million dollars)
3721- —	**AIRCRAFT**						
	Total	**(NA)**	**(X)**	**36 709.3**	**(NA)**	**(X)**	**24 235.1**
37211 —	Military aircraft (including all aircraft for U.S. military and any other aircraft built to military specifications):						
37211 00	Military aircraft (including all aircraft for U.S. military and any other aircraft built to military specifications) ..... number	15	(S)	17 609.0	29	(S)	9 634.5
37215 —	Civilian aircraft:						
37215 00	Civilian aircraft (for additional detail, see Current Industrial Report M-37G, New Civil Aircraft and Engines)	27	(X)	12 533.7	34	(X)	8 769.4
37217 —	Modification, conversion, and overhaul of previously accepted aircraft	(NA)	(X)	3 508.9	(NA)	(X)	2 783.4
37217 11	For U.S. military aircraft and all other aircraft built to military specifications	18	(X)	2 602.4	20	(X)	2 081.3
37217 51	For civilian customers	21	(X)	905.2	35	(X)	700.2
37217 00	Modification, conversion, and overhaul of previously accepted aircraft, n.s.k.	(NA)	(X)	1.3	(NA)	(X)	1.9
37218 —	Other aeronautical services on complete aircraft	(NA)	(X)	2 735.4	(NA)	(X)	2 817.1
	For military customers:						
37218 13	Research and development on complete aircraft	12	(X)	1 441.0	11	(X)	713.1
37218 15	All other aeronautical services on complete aircraft	11	(X)	987.6	15	(X)	1 394.7
	For civilian customers:						
37218 53	Research and development on complete aircraft	3	(X)	1.0	7	(X)	90.7
37218 55	All other aeronautical services on complete aircraft	10	(X)	305.0	19	(X)	618.6
37218 00	Aeronautical services on complete aircraft, n.e.c., n.s.k.	(NA)	(X)	.8	(NA)	(X)	-

See footnotes at end of table.

Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987			1982		
		Number of companies with shipments of $100,000 or more	Product shipments[1]		Number of companies with shipments of $100,000 or more	Product shipments[1]	
			Quantity[2]	Value (million dollars)		Quantity[2]	Value (million dollars)
3721- --	**AIRCRAFT**—Con.						
37210 --	Aircraft, n.s.k.	(NA)	(X)	322.3	(NA)	(X)	30.7
37210 00	Aircraft, n.s.k., typically for establishments with 20 employees or more (see note)	(NA)	(X)	322.3	(NA)	(X)	30.7
37210 02	Aircraft, n.s.k., typically for establishments with less than 20 employees (see note)	(NA)	(X)	-	(NA)	(X)	-
3724- --	**AIRCRAFT ENGINES AND ENGINE PARTS**						
	Total	**(NA)**	**(X)**	**18 675.7**	**(NA)**	**(X)**	**11 640.8**
37241 --	Aircraft engines for military aircraft:						
37241 00	Military engines (for U.S. military aircraft and any other aircraft built to military specifications)	30	(X)	4 205.6	1[3]	(X)	(D)
37242 --	Aircraft engines for civilian aircraft:						
37242 00	Aircraft engines for civilian aircraft (for additional detail, see Current Industrial Report M-37G, New Civil Aircraft and Engines)	13	(X)	2 806.3	10	(X)	2 142.6
37243 --	Aeronautical services on aircraft engines	(NA)	(X)	1 992.9	(NA)	(X)	(D)
	Research and development work on aircraft engines, including receipts for work done for affiliates and other establishments of the same company:						
37243 21	For U.S. military aircraft engines and all other engines built to military specifications	16	(X)	1 023.1	7	(X)	831.2
37243 23	For civilian aircraft engines	10	(X)	58.5	5	(X)	25.6
	All other aeronautical services on aircraft engines:						
37243 31	For U.S. military aircraft engines and all other engines built to military specifications	13	(X)	372.8	11	(X)	(D)
37243 33	For civilian aircraft engines	18	(X)	530.7	21	(X)	(D)
37243 00	Aeronautical services on aircraft engines, n.s.k.	(NA)	(X)	7.9	(NA)	(X)	-
37244 --	Aircraft engine parts and accessories	(NA)	(X)	9 402.7	(NA)	(X)	5 725.5
	Military:						
37244 01	For spark ignition reciprocating or rotary internal combustion engines	60	(X)	1 428.4	131	(X)	2 901.1
37244 02	For other engines	99	(X)	2 816.9			
	Civilian:						
37244 05	For spark ignition reciprocating or rotary internal combustion engines	65	(X)	1 521.2	158	(X)	2 816.1
37244 06	For other engines	107	(X)	3 527.5			
37244 00	Aircraft engine parts and accessories, n.s.k.	(NA)	(X)	108.7	(NA)	(X)	8.3
37240 --	Aircraft engines and engine parts, n.s.k.	(NA)	(X)	268.2	(NA)	(X)	79.4
37240 00	Aircraft engines and engine parts, n.s.k., typically for establishments with 20 employees or more (see note)	(NA)	(X)	137.7	(NA)	(X)	36.2
37240 02	Aircraft engines and engine parts, n.s.k., typically for establishments with less than 20 employees	(NA)	(X)	130.5	(NA)	(X)	43.2
3728- --	**AIRCRAFT PARTS AND AUXILIARY EQUIPMENT, N.E.C.**						
	Total	**(NA)**	**(X)**	**19 654.9**	**(NA)**	**(X)**	**10 789.1**
37281 --	Aircraft parts and auxiliary equipment	(NA)	(X)	15 919.5	(NA)	(X)	9 862.4
	Aircraft mechanical power transmission equipment:						
37281 13	For U.S. military aircraft and all other aircraft built to military specifications	18	(X)	692.3	16	(X)	342.6
37281 15	For civilian aircraft	21	(X)	358.4	17	(X)	215.2
	Aircraft hydraulic subassemblies:						
37281 73	For U.S. military aircraft and all other aircraft built to military specifications	23	(X)	285.9	32	(X)	218.4
37281 75	For civilian aircraft	20	(X)	622.4	30	(X)	111.8
	Aircraft pneumatic subassemblies:						
37281 83	For U.S. military aircraft and all other aircraft built to military specifications	11	(X)	193.6	19	(X)	125.2
37281 85	For civilian aircraft	11	(X)	229.2	17	(X)	163.0
	Aircraft landing gear:						
37281 94	For U.S. military aircraft and all other aircraft built to military specifications	15	(X)	482.8	23	(X)	193.9
37281 95	For civilian aircraft	21	(X)	381.3	21	(X)	160.3
	Other aircraft subassemblies and parts (except aircraft propellers and helicopter rotors):						
37281 98	For U.S. military aircraft and all other aircraft built to military specifications	211	(X)	6 949.9	190	(X)	3 902.9
37281 99	For civilian aircraft	193	(X)	5 425.5	263	(X)	4 331.5
37281 00	Aircraft parts and auxiliary equipment, n.e.c., n.s.k.	(NA)	(X)	298.3	(NA)	(X)	97.5
37282 --	Aircraft propellers and helicopter rotors	(NA)	(X)	724.1	(NA)	(X)	191.0
37282 10	Complete propellers, excluding helicopter rotors ..... number	5	(S)	69.6	5	(NA)	(3)
37282 31	Propeller blades	6	(X)	110.6	8	(X)	24.7
37282 51	Propeller parts, except propeller blades	9			6	(X)	110.1
37282 61	Helicopter rotors and parts	22	(X)	542.7	20	(X)	56.1
37282 00	Aircraft propellers and propeller parts, n.s.k.	(NA)	(X)	1.2	(NA)	(X)	-
37283 --	Research and development on aircraft parts	(NA)	(X)	2 378.3	(NA)	(X)	432.2
37283 13	For U.S. military aircraft and all other aircraft built to military specifications	20	(X)	2 243.0	28	(X)	300.0
37283 15	For civilian aircraft	14	(X)	134.9	26	(X)	132.1
37283 00	Research and development on aircraft parts, n.s.k.	(NA)	(X)	4	(NA)	(X)	2

See footnotes at end of table.

Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987			1982		
		Number of companies with shipments of $100,000 or more	Product shipments[1]		Number of companies with shipments of $100,000 or more	Product shipments[1]	
			Quantity[2]	Value (million dollars)		Quantity[2]	Value (million dollars)
3728- —	**AIRCRAFT PARTS AND AUXILIARY EQUIPMENT, N.E.C.**—Con.						
37280 —	Aircraft parts and auxiliary equipment, n.e.c., n.s.k.	(NA)	(X)	632.9	(NA)	(X)	303.5
37280 00	Aircraft parts and auxiliary equipment, n.e.c., n.s.k., typically for establishments with 20 employees or more (see note)	(NA)	(X)	403.8	(NA)	(X)	175.0
37280 02	Aircraft parts and auxiliary equipment, n.e.c., n.s.k., typically for establishments with less than 20 employees (see note)	(NA)	(X)	229.1	(NA)	(X)	128.5
3761- —	**GUIDED MISSILES AND SPACE VEHICLES**						
	Total	**(NA)**	**(X)**	**16 012.3**	**(NA)**	**(X)**	**8 585.6**
37611 —	Complete guided missiles (excluding propulsion systems):						
37611 00	Complete guided missiles	12	(X)	3 062.4	15	(X)	2 644.8
37612 —	Complete space vehicles (excluding propulsion systems)	(NA)	(X)	5 172.0	(NA)	(X)	2 010.7
37612 01	For U.S. Government military customers—number	8	(S)	3 671.7	7	(S)	652.9
37612 02	For other customers—do	6	(S)	1 499.7	6	(S)	1 357.9
37612 00	Space vehicles, complete, excluding propulsion units, n.s.k.	(NA)	(X)	6	(NA)	(X)	-
37613 —	Research and development on complete guided missiles:						
37613 00	Research and development on complete guided missiles	11	(X)	3 295.8	10	(X)	1 504.0
37614 —	Research and development on complete space vehicles	(NA)	(X)	974.6	(NA)	(X)	387.2
37614 01	For U.S. Government military customers	8	(X)	974.6	6	(X)	664.1
37614 02	For other customers	4			8	(X)	323.1
37614 00	Research and development on complete space vehicles, n.s.k.	(NA)	(X)	-	(NA)	(X)	-
37615 —	All other services on complete guided missiles and space vehicles	(NA)	(X)	3 271.4	(NA)	(X)	1 438.3
37615 01	All other services on complete guided missiles	10	(X)	1 094.0	(NA)	(NA)	(NA)
	All other services on complete space vehicles:						
37615 02	For U.S. Government military customers	11	(X)	1 429.9	10	(X)	666.0
37615 03	For other customers	8	(X)	747.5	10	(X)	368.9
37615 00	Services, except research and development, on complete guided missiles and space vehicles, n.s.k.	(NA)	(X)	-	(NA)	(X)	.2
37610 —	Guided missiles and space vehicles, n.s.k.	(NA)	(X)	36.2	(NA)	(X)	.5
37610 00	Guided missiles and space vehicles, n.s.k., typically for establishments with 20 employees or more (see note)	(NA)	(X)	36.2	(NA)	(X)	.5
37610 02	Guided missiles and space vehicles, n.s.k., typically for establishments with less than 20 employees (see note)	(NA)	(X)	-	(NA)	(X)	-
3764- —	**SPACE PROPULSION UNITS AND PARTS**						
	Total	**(NA)**	**(X)**	**3 464.9**	**(NA)**	**(X)**	**2 199.1**
37645 —	Complete missile or space vehicle engines and/or propulsion units	(NA)	(X)	1 846.0	(NA)	(X)	960.7
37645 11	For U.S. Government military customers—number	13	(S)	1 392.6	13	746.8	524.5
37645 13	For U.S. Government nonmilitary customers—do	6	(S)	395.9	7	(S)	374.3
37645 15	For other customers—do	7	(S)	57.3	7	75.6	61.8
37645 00	Missile or space vehicle engines and/or propulsion units, complete, n.s.k.	(NA)	(X)	.2	(NA)	(X)	-
37646 —	Research and development on complete missile or space vehicle engines and/or propulsion units	(NA)	(X)	615.3	(NA)	(X)	694.8
37646 11	For U.S. Government military customers	12	(X)	456.4			
37646 13	For U.S. Government nonmilitary customers	6	(X)	(4)	2	(X)	694.8
37646 15	For other customers	3	(X)	4158.7			
37646 00	Research and development on complete missile or space vehicle engines and/or propulsion units, n.s.k.	(NA)	(X)	.2	(NA)	(X)	-
37647 —	All other services on complete missile or space vehicle engines and/or propulsion units	(NA)	(X)	149.2	(NA)	(X)	238.0
37647 11	For U.S. Government military customers	8	(X)	110.7			
37647 13	For U.S. Government nonmilitary customers	4	(X)	(5)	5	(X)	238.0
37647 15	For other customers	5	(X)	438.4			
37647 00	Services on complete missile or space vehicle engines and/or propulsion units, n.s.k.	(NA)	(X)	-	(NA)	(X)	-
37648 —	Missile and space vehicle engine and/or propulsion unit parts and accessories	(NA)	(X)	816.5	(NA)	(X)	301.5
37648 11	For U.S. Government military customers	29	(X)	539.9	30	(X)	169.9
37648 13	For U.S. Government nonmilitary customers	9	(X)	274.3	17	(X)	101.5
37648 15	For other customers	8			9	(X)	30.0
37648 00	Missile and space vehicle engine and/or propulsion unit parts and accessories, n.s.k.	(NA)	(X)	2.4	(NA)	(X)	-
37640 —	Space propulsion units and parts, n.s.k.	(NA)	(X)	38.0	(NA)	(X)	4.2
37640 00	Space propulsion units and parts, n.s.k., typically for establishments with 20 employees or more (see note)	(NA)	(X)	38.0	(NA)	(X)	4.2
37640 02	Space propulsion units and parts, n.s.k., typically for establishments with less than 20 employees (see note)	(NA)	(X)	-	(NA)	(X)	-

See footnotes at end of table.

Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text.]

1987 product code	Product	1987			1982		
		Number of companies with shipments of $100,000 or more	Product shipments[1]		Number of companies with shipments of $100,000 or more	Product shipments[1]	
			Quantity[2]	Value (million dollars)		Quantity[2]	Value (million dollars)
3769- --	**SPACE VEHICLE EQUIPMENT, N.E.C.**						
	Total	**(NA)**	**(X)**	**3 354.7**	**(NA)**	**(X)**	**2 573.9**
37692 --	Missile and space vehicle components, parts, and subassemblies, n.e.c.	(NA)	(X)	2 344.8	(NA)	(X)	1 161.0
	For U.S. Government military customers:						
37692 11	Airframes	19	(X)	307.0	17	(X)	141.3
37692 13	Space capsules	6	(X)	1 817.0	7	(X)	109.6
37692 19	All other	59			42	(X)	528.0
37692 25	For U.S. Government nonmilitary customers	28	(X)	512.5	21	(X)	283.9
37692 35	For other customers	17	(X)	181.8	16	(X)	84.3
37692 00	Missile and space vehicle parts and subassemblies, n.s.k.	(NA)	(X)	26.3	(NA)	(X)	14.0
37694 --	Research and development on missile and space vehicle parts and components, n.e.c.	(NA)	(X)	980.5	(NA)	(X)	1 403.3
	For U.S. Government military customers:						
37694 14	Airframes and space capsules	3	(X)	710.8	8	(X)	517.6
37694 19	All other	18			13	(X)	698.7
37694 25	For U.S. Government nonmilitary customers	9	(X)	227.8	11	(X)	119.2
37694 35	For other customers	8	(X)	41.9	6	(X)	66.1
37694 00	Research and development on missile and space vehicle parts and components, n.s.k.	(NA)	(X)	-	(NA)	(X)	1.6
37690 --	Space vehicle equipment, n.e.c., n.s.k.	(NA)	(X)	29.4	(NA)	(X)	9.6
37690 00	Space vehicle equipment, n.e.c., n.s.k., typically for establishments with 20 employees or more (see note)	(NA)	(X)	21.7	(NA)	(X)	2.9
37690 02	Space vehicle equipment, n.e.c., n.s.k., typically for establishments with less than 20 employees (see note)	(NA)	(X)	7.7	(NA)	(X)	4.7

Note: In 1987 Census of Manufactures, data for establishments of small single unit companies with up to 20 employees were estimated from administrative record data rather than data actually collected from respondents. Employment cutoffs used for administrative-records for each industry and shipments figures are included in code ending with "002". In both 1987 and 1982 Censuses of Manufactures, products not completely identified on standard forms were coded in appropriate product class (five-digit) followed by "00" or to appropriate product group code (four-digit) followed by "000".

[1]Data reported by all producers, not just those with shipments of $100,000 or more.
[2]For some establishments, data have been estimated from central unit values which are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated; ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).
[3]For 1982, product codes 37282 10 and 37282 51 were combined to avoid disclosing data for individual companies.
[4]For 1917, product codes 37646 13 and 37646 15 are combined to avoid disclosing data for individual companies.
[5]For 1987, product codes 37647 13 and 37647 15 are combined to avoid disclosing data for individual companies.

Table 3. Materials Consumed by Kind: 1987 and 1982

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text.]

1987 material code	Material	1987		1982	
		Quantity[1]	Delivered cost (million dollars)	Quantity[1]	Delivered cost (million dollars)
	INDUSTRY 3721, AIRCRAFT				
	Materials, parts, containers, and supplies	**(X)**	**22 187.0**	**(X)**	**14 315.3**
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes, 1,000 s tons	(S)	57.0	*7.1	7.6
331012	Sheet and strip, do.	(S)	15.3	(S)	1.5
331013	Plates, do.	(D)	(*)	(S)	1.5
331015	Structural shapes, do.	(D)	(*)	(S)	1.3
331017	Wire and wire products, do.	(D)	(*)		
331019	All other carbon steel mill shapes and forms, do.	(S)	*95.8	4.4	4.1
	Alloy steel, except stainless:				
331021	Bars and bar shapes, 1,000 s tons	**8.1	13.1	*4.8	3.2
331029	All other alloy steel mill shapes and forms, do.	(S)	7.4	**2.8	2.4
	Stainless steel:				
331033	Sheet and strip, 1,000 s tons	(S)	16.0	(S)	3.5
331050	All other stainless steel mill shapes and forms, do.	(S)	26.7	(S)	7.9
335105	Copper and copper-base alloy, mil lb	(S)	69.9	(D)	(*)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil, mil lb	(S)	97.0	*69.4	99.3
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc., do.	**70.4	171.2	**35.5	83.4
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.), do.	(D)	(*)	(S)	8.0
335601	Titanium and titanium-base alloy, 1,000 lb	(S)	107.8	(S)	35.8
335792	Copper insulated wire and cable (except magnet wire), mil lb	(D)	(*)	(S)	39.7
	Castings, rough and semifinished:				
332011	Iron (gray and malleable), 1,000 s tons	(D)	(*)	(NA)	(*)
332045	Steel, do.	(D)	(*)	* 9	3.8
336005	Aluminum and aluminum-base alloy, mil lb	(S)	115.2	*8.2	39.7
336003	Other nonferrous, do.	(D)	(*)	(D)	(*)

See footnotes at end of table.

Table 3. **Materials Consumed by Kind: 1987 and 1982**—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987 Quantity[1]	1987 Delivered cost (million dollars)	1982 Quantity[1]	1982 Delivered cost (million dollars)
	INDUSTRY 3721, AIRCRAFT—Con.				
	Forgings:				
346200	Iron and steel ..... 1,000 s tons	(S)	67.6	(S)	15.5
346310	Aluminum and aluminum-base alloy ..... mil lb	(S)	169.9	14.5	63.6
346326	Titanium and titanium-base alloy ..... do	(S)	48.2	(D)	(4)
346001	Other ..... do	(D)	(4)	(NA)	(5)
362112	Electric motors and generators ..... thousands	(S)	12.9	(D)	(4)
	Bearings, including mounted and unmounted:				
356218	Ball	(X)	26.2	(X)	10.0
356201	Roller	(X)	(4)	(X)	(4)
339915	Metal powders ..... mil lb	(D)	(4)	-	-
	Aerospace type fluid power parts and components:				
349235	Valves (hydraulic and pneumatic)	(X)	106.2	(X)	26.9
349261	Hose or tube fittings and assemblies (hydraulic and pneumatic)	(X)	103.2	(X)	10.8
359303	Cylinders and rotary actuators (hydraulic and pneumatic)	(X)	(4)	(X)	31.1
359421	Pumps and motors (hydraulic)	(X)	141.0	(X)	30.3
220129	Broadwoven fabrics (cotton, wool, manmade fiber fabrics, etc.) ..... mil lin yd	(S)	32.6	(S)	41.3
280020	Ceramic raw materials, including powders, chemicals, and fibers, excluding refractory uses	(X)	(4)	(X)	(4)
320601	Ceramic and ceramic composite parts, components, and accessories	(X)	(4)	(X)	(5)
345001	Bolts, nuts, screws, rivets, washers, and screw machine products	(X)	360.5	(X)	137.0
285101	Paints, varnishes, lacquers, shellacs, japans, enamels, and allied products ..... 1,000 gal	(S)	86.1	(S)	30.8
366302	Radio and electronic communication equipment and navigation aids, airborne transmitters and receivers, radar, electronic-type fire control equipment, etc.	(X)	687.4	(X)	529.7
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic-type components	(X)	169.5	(X)	(5)
382711	Sighting, tracking, and fire control equipment, optical type	(X)	(4)	(X)	72.0
354501	Cutting tools for machine tools	(X)	44.7	(X)	14.5
342973	Aircraft metal hardware	(X)	95.2	(X)	52.0
381210	Aircraft flight instruments	(X)	388.2	(X)	101.7
382911	Aircraft engine instruments	(X)	(4)	(X)	71.2
372400	Aircraft engines	(X)	3 454.3	(X)	975.9
372440	Aircraft engine parts	(X)	62.9	(X)	62.2
372851	Aircraft propellers and parts thereof	(X)	55.0	(X)	38.8
372810	Aircraft parts, except engines and engine parts	(X)	4 603.4	(X)	1 453.2
376480	Guided missile and space vehicle engine parts	(X)	-	(X)	-
376920	Guided missile and space vehicle airframe parts	(X)	-	(X)	-
970099	All other materials and components, parts, containers, and supplies	(X)	[3] 023.6	(X)	[6] 1 763.1
971000	Materials, parts, containers, and supplies, n.s.k.[2]	(X)	7 556.0	(X)	[6] 8 441.0
	INDUSTRY 3724, AIRCRAFT ENGINES AND ENGINE PARTS				
	Materials, parts, containers, and supplies	**(X)**	**7 669.2**	**(X)**	**5 059.9**
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes ..... 1,000 s tons	(S)	13.3	7.3	8.7
331012	Sheet and strip ..... do	(S)	1.6	6.0	3.2
331013	Plates ..... do	(S)	1.2	4.6	2.8
331015	Structural shapes ..... do			*.7	(D)
331017	Wire and wire products ..... do	(S)	1.9	(Z)	(D)
331019	All other carbon steel mill shapes and forms ..... do			16.3	7.9
	Alloy steel, except stainless:				
331021	Bars and bar shapes ..... 1,000 s tons	(S)	66.3	*44.3	89.5
331029	All other alloy steel mill shapes and forms ..... do	(S)	23.8	**13.3	47.5
	Stainless steel:				
331033	Sheet and strip ..... 1,000 s tons	(S)	23.4	(S)	21.3
331050	All other stainless steel mill shapes and forms ..... do	(S)	23.4	**16.3	32.1
335105	Copper and copper-base alloy ..... mil lb	(S)	3	(D)	(4)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil ..... mil lb	(S)	7.3	(S)	3.7
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. ..... do	(S)	17.7	54.0	31.4
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) ..... do	(S)	1.2		
335601	Titanium and titanium-base alloy ..... 1,000 lb	(S)	86.2	5.4	91.8
335792	Copper insulated wire and cable (except magnet wire) ..... mil lb	(D)	(4)	(D)	(4)
	Castings, rough and semifinished:				
332011	Iron (gray and malleable) ..... 1,000 s tons	(S)	22.4	(NA)	(5)
332045	Steel ..... do	(S)	174.4	(S)	115.6
336005	Aluminum and aluminum-base alloy ..... mil lb	(S)	60.9	(S)	93.1
336003	Other nonferrous ..... do	(S)	190.4	(D)	(4)
	Forgings:				
346200	Iron and steel ..... 1,000 s tons	(S)	293.2	*64.4	510.1
346310	Aluminum and aluminum-base alloy ..... mil lb	(D)	(4)	(S)	15.1
346326	Titanium and titanium-base alloy ..... do	(S)	433.8	**17.5	345.3
346001	Other ..... do	(S)	[6]16.8	(NA)	(5)
362112	Electric motors and generators ..... thousands	(S)	2.5	(D)	(4)
	Bearings, including mounted and unmounted:				
356218	Ball	(X)	22.8	(X)	45.1
356201	Roller	(X)	(4)	(X)	40.8
339915	Metal powders ..... mil lb	(S)	2.0	(S)	3.9

See footnotes at end of table.

Table 3. **Materials Consumed by Kind: 1987 and 1982**—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity[1]	Delivered cost (million dollars)	Quantity[1]	Delivered cost (million dollars)
	INDUSTRY 3724, AIRCRAFT ENGINES AND ENGINE PARTS—Con.				
	Aerospace type fluid power parts and components:				
349235	Valves (hydraulic and pneumatic)	(X)	2.7	(X)	(*)
349261	Hose or tube fittings and assemblies (hydraulic and pneumatic)	(X)	7.1	(X)	(*)
359303	Cylinders and rotary actuators (hydraulic and pneumatic)	(X)	7.5	(X)	(*)
359421	Pumps and motors (hydraulic)			(X)	(*)
220129	Broadwoven fabrics (cotton, wool, manmade fiber fabrics, etc.) mil lin yd	(D)	(*)	-	-
280020	Ceramic raw materials, including powders, chemicals, and fibers, excluding refractory uses	(X)	20.6	(X)	(*)
320601	Ceramic and ceramic composite parts, components, and accessories			(X)	(*)
345001	Bolts, nuts, screws, rivets, washers, and screw machine products	(X)	33.9	(X)	63.8
285101	Paints, varnishes, lacquers, shellacs, japans, enamels, and allied products 1,000 gal	(S)	3.8	**136.9	2.1
366302	Radio and electronic communication equipment and navigation aids, airborne transmitters and receivers, radar, electronic-type fire control equipment, etc.	(X)	(*)	(X)	-
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic-type components	(X)	26.8	(X)	(*)
382711	Sighting, tracking, and fire control equipment, optical type	(X)	(*)	(X)	-
354501	Cutting tools for machine tools	(X)	129.2	(X)	64.2
342973	Aircraft metal hardware	(X)	8.0	(X)	(*)
381210	Aircraft flight instruments	(X)	64.0	(X)	(Z)
382911	Aircraft engine instruments			(X)	(*)
372400	Aircraft engines	(X)	42.3	(X)	(*)
372440	Aircraft engine parts	(X)	1 169.5	(X)	646.0
372851	Aircraft propellers and parts thereof	(X)	(*)	(X)	(*)
372810	Aircraft parts, except engines and engine parts	(X)	(*)	(X)	59.8
376480	Guided missile and space vehicle engine parts	(X)	-	(X)	(*)
376920	Guided missile and space vehicle airframe parts	(X)	(*)	(X)	(*)
970099	All other materials and components, parts, containers, and supplies	(X)	*2 866.*	(D)	*,*2 114.8
971000	Materials, parts, containers, and supplies, n.s.k.[2]	(X)	1 000.4	(X)	590.3
	INDUSTRY 3728, AIRCRAFT PARTS AND EQUIPMENT, N.E.C.				
	Materials, parts, containers, and supplies	**(X)**	**4 513.0**	**(X)**	**3 399.6**
	Mill shapes and forms, except castings:				
	Carbon steel:				
331011	Bars and bar shapes 1,000 s tons	(S)	19.1	**12.6	8.2
331012	Sheet and strip do	(S)	12.1	*6.8	3.4
331013	Plates do	(S)	5.3	(S)	4.0
331015	Structural shapes do	(S)	3.1	*5.4	5.9
331017	Wire and wire products do	(S)	4.5	*.4	1.0
331019	All other carbon steel mill shapes and forms do	(S)	2.3	**11.2	12.3
	Alloy steel, except stainless:				
331021	Bars and bar shapes 1,000 s tons	(S)	33.3	(S)	9.8
331029	All other alloy steel mill shapes and forms do	(S)	24.1	*7.9	10.9
	Stainless steel:				
331033	Sheet and strip 1,000 s tons	(S)	23.0	(S)	7.4
331050	All other stainless steel mill shapes and forms do	*9.1	51.0	(S)	13.5
335105	Copper and copper-base alloy mil lb	(S)	2.9	(S)	3.0
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil mil lb	(S)	116.8	(S)	40.4
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc. do	(S)	80.5	(S)	87.5
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.) do	(S)	10.0	(S)	4.5
335601	Titanium and titanium-base alloy 1,000 lb	(S)	21.7	(S)	66.3
335792	Copper insulated wire and cable (except magnet wire) mil lb	(S)	7.0	(S)	8.8
	Castings (rough and semifinished):				
332011	Iron (gray and malleable) 1,000 s tons	(S)	1.4	(NA)	(*)
332045	Steel do	(S)	73.9	(S)	13.8
336005	Aluminum and aluminum-base alloy mil lb	(S)	55.4	(S)	26.5
336003	Other nonferrous do	(S)	26.8	(D)	(*)
	Forgings:				
346200	Iron and steel 1,000 s tons	(S)	62.2	(S)	67.6
346310	Aluminum and aluminum-base alloy mil lb	(S)	119.1	(S)	63.1
346326	Titanium and titanium-base alloy do	(S)	22.7	*3.1	15.1
346001	Other do	(S)	10.1	(NA)	(*)
362112	Electric motors and generators thousands	(S)	11.5	(D)	(*)
	Bearings, including mounted and unmounted:				
356218	Ball	(X)	19.5	(X)	21.7
356201	Roller	(X)	16.3	(X)	13.5
339915	Metal powders mil lb	(S)	3.9	(S)	10.7
	Aerospace type fluid power parts and components:				
349235	Valves (hydraulic and pneumatic)	(X)	27.5	(X)	15.4
349261	Hose or tube fittings and assemblies	(X)	4.3	(X)	7
359303	Cylinders and rotary activators (hydraulic and pneumatic)	(X)	39.0	(X)	4.7
359421	Pumps and motors (hydraulic)	(X)	20.5	(X)	8.0
220129	Broadwoven fabrics (cotton, wool, manmade fiber fabrics, etc.) mil lin yd	(S)	3.4	(S)	7.0
280020	Ceramic raw materials, including powders, chemicals, and fibers, excluding refractory uses	(X)	5.4	(X)	(*)
320601	Ceramic and ceramic composite parts, components, and accessories	(X)	4.9	(X)	(*)
345001	Bolts, nuts, screws, rivets, washers, and screw machine products	(X)	140.2	(X)	67.9
285101	Paints, varnishes, lacquers, shellacs, japans, enamels, and allied products 1,000 gal	(S)	20.8	(S)	12.0

See footnotes at end of table

Table 3. **Materials Consumed by Kind: 1987 and 1982**—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity[1]	Delivered cost (million dollars)	Quantity[1]	Delivered cost (million dollars)
	INDUSTRY 3728, AIRCRAFT PARTS AND EQUIPMENT, N.E.C.—Con.				
366302	Radio and electronic communication equipment and navigation aids; airborne transmitters and receivers, radar, electronic-type fire control equipment, etc.	(X)	(*)	(X)	11.3
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic-type components	(X)	277.5	(X)	(*)
382711	Sighting, tracking, and fire control equipment, optical type	(X)	(*)	(X)	1
354501	Cutting tools for machine tools	(X)	45.3	(X)	31.4
342973	Aircraft metal hardware	(X)	176.4	(X)	21.7
381210	Aircraft flight instruments	(X)	(*)	(X)	(*)
382911	Aircraft engine instruments	(X)	-	(X)	(*)
372400	Aircraft engines	(X)	187.6	(X)	(*)
372440	Aircraft engine parts			(X)	(*)
372851	Aircraft propellers and parts thereof	(X)	(*)	(X)	(*)
372810	Aircraft parts, except engines and engine parts	(X)	526.8	(X)	136.0
376480	Guided missile and space vehicle engine parts	(X)	(*)	(X)	6.2
376920	Guided missile and space vehicle airframe parts	(X)	(*)	(X)	(*)
970099	All other materials and components, parts, containers, and supplies	(X)	[4] 467.2	(D)	[4,5,7] 900.0
971000	Materials, parts, containers, and supplies, n.s.k.[2]	(X)	716.7	(X)	638.3
	INDUSTRY 3761, GUIDED MISSILES AND SPACE VEHICLES				
	Materials, parts, containers, and supplies	**(X)**	**5 966.2**	**(X)**	**2 533.4**
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes, 1,000 s tons	(S)	1	* 4	5
331012	Sheet and strip, do.	(D)	(*)	(Z)	(Z)
331013	Plates, do.	(D)	(*)	(S)	2
331015	Structural shapes, do.	(D)	(*)	(D)	(*)
331017	Wire and wire products, do.	(D)	(*)	(D)	(*)
331019	All other carbon steel mill shapes and forms, do.	(D)	(*)	(D)	(*)
	Alloy steel, except stainless:				
331021	Bars and bar shapes, 1,000 s tons	(S)	2.1	(D)	(*)
331029	All other alloy steel mill shapes and forms, do.			-	-
	Stainless steel:				
331033	Sheet and strip, 1,000 s tons	(S)	6.1	(Z)	2
331050	All other stainless steel mill shapes and forms, do.			* 2	1.1
335105	Copper and copper-base alloy, mil lb.	(D)	(*)	(D)	(*)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil, mil lb.	(S)	13.1	2.8	3.8
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc., do.	(S)	8.3	(D)	(*)
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.), do.	(S)	2.6	(D)	(*)
335601	Titanium and titanium-base alloy, 1,000 lb.	(D)	(*)	(D)	(*)
335792	Copper insulated wire and cable (except magnet wire), mil lb.	(D)	(*)	(S)	4.5
	Castings (rough and semifinished):				
332011	Iron (gray and malleable), 1,000 s tons	-	-	(NA)	(*)
332045	Steel, do.	(X)	(*)	(D)	(*)
336005	Aluminum and aluminum-base alloy, mil lb.	(S)	37.1	6.0	7.4
336003	Other nonferrous, except aluminum, do.	(D)	(*)	(D)	(*)
	Forgings:				
346200	Iron and steel, 1,000 s tons	(S)	7	(D)	(*)
346310	Aluminum and aluminum-base alloy, mil lb.	(S)	2.4	2.2	3.3
346326	Titanium and titanium-base alloy, do.	(D)	(*)	(D)	(*)
346001	Other, do.	(D)	(*)	(NA)	(*)
362112	Electric motors and generators, thousands	-	-	(D)	(*)
	Bearings, including mounted and unmounted:				
356218	Ball	(X)	(*)	(X)	5
356201	Roller	(X)	-	(X)	-
339915	Metal powders, mil lb.	(D)	(*)	-	-
	Aerospace type fluid power parts and components:				
349235	Valves (hydraulic and pneumatic)	(X)	(*)	(X)	2.7
349261	Hose or tube fittings and assemblies (hydraulic and pneumatic)	(X)	(*)	(X)	(*)
359303	Cylinders and rotary actuators (hydraulic and pneumatic)	(X)	(*)	(X)	(*)
359421	Pumps and motors (hydraulic)	(X)	(*)	(X)	(*)
220129	Broadwoven fabrics (cotton, wool, manmade fiber fabrics, etc.), mil lin yd	(D)	(*)	-	-
280020	Ceramic raw materials, including powders, chemicals, and fibers, excluding refractory uses	(X)	(*)	(X)	(*)
320601	Ceramic and ceramic composite parts, components, and accessories	(X)	(*)	(X)	(*)
345001	Bolts, nuts, screws, rivets, washers, and screw machine products	(X)	10.7	(X)	20.2
285101	Paints, varnishes, lacquers, shellacs, japans, enamels, and allied products, 1,000 gal	(D)	(*)	(S)	2.0
366302	Radio and electronic communication equipment and navigation aids; airborne transmitters and receivers, radar, electronic-type fire control equipment, etc.	(X)	921.7	(X)	640.7
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic-type components	(X)	233.6	(X)	(*)
382711	Sighting, tracking, and fire control equipment, optical type	(X)	413.6	(X)	(*)
354501	Cutting tools for machine tools	(X)	(*)	(X)	(*)
342973	Aircraft metal hardware	(X)	(*)	(X)	(*)
381210	Aircraft flight instruments	(X)	(*)	(X)	(*)
382911	Aircraft engine instruments	(X)	(*)	(X)	-
372400	Aircraft engines	(X)	(*)	(X)	(*)
372440	Aircraft engine parts	(X)	-	(X)	-
372851	Aircraft propellers and parts thereof	(X)	(*)	(X)	-
372810	Aircraft parts, except engines and engine parts	(X)	(*)	(X)	(*)

See footnotes at end of table.

Table 3. **Materials Consumed by Kind: 1987 and 1982**—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity[1]	Delivered cost (million dollars)	Quantity[1]	Delivered cost (million dollars)
	INDUSTRY 3761, GUIDED MISSILES AND SPACE VEHICLES—Con.				
376480	Guided missile and space vehicle engine parts	(X)	49.1	(X)	24.6
376920	Guided missile and space vehicle airframe parts	(X)	674.3	(X)	(*)
970099	All other material and components, parts, containers, and supplies	(X)	*3 589.5	(X)	* * [1] 1 821.7
971000	Materials, parts, containers, and supplies, n.s.k.[2]	(X)	2	(X)	(Z)
	INDUSTRY 3764, SPACE PROPULSION UNITS AND PARTS				
	Materials, parts, containers, and supplies	**(X)**	**1 146.1**	**(X)**	**645.4**
	Mill shapes and forms, except castings and forgings:				
	Carbon steel:				
331011	Bars and bar shapes, 1,000 s tons	(S)	5.4	(D)	(*)
331012	Sheet and strip, do	(D)	(*)	(D)	(*)
331013	Plates, do	(D)	(*)	(D)	(*)
331015	Structural shapes, do	(D)	(*)	(D)	(*)
331017	Wire and wire products, do	(D)	(*)	(D)	(*)
331018	All other carbon steel mill shapes and forms, do	(D)	(*)	(D)	(*)
	Alloy steel, except stainless:				
331021	Bars and bar shapes, 1,000 s tons	(S)	18.7	(S)	1.5
331029	All other alloy steel mill shapes and forms, do	(S)	1.8	(D)	(*)
	Stainless steel:				
331033	Sheet and strip, 1,000 s tons	(S)	6.1	**1.9	3.6
331050	All other stainless steel mill shapes and forms, do			(S)	1.3
335105	Copper and copper-base alloy, mil lb	(S)	(*)	(D)	(*)
	Aluminum and aluminum-base alloy:				
335301	Sheet, plate, and foil, mil lb	(D)	(*)	(S)	1.5
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc., do	(D)	(*)	(S)	2.1
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.), do	(D)	(*)	(D)	(*)
335001	Titanium and titanium-base alloy, 1,000 lb	(D)	(*)	(D)	(*)
335792	Copper insulated wire and cable (except magnet wire), mil lb	-	-	-	-
	Castings (rough and semifinished):				
332011	Iron (gray and malleable), 1,000 s tons	-	-	(NA)	(*)
332045	Steel, do	(S)	11.9	* 6	4.7
336005	Aluminum and aluminum-base alloy, mil lb	6	(*)	(S)	3.0
336003	Other nonferrous, do	(S)	(*)	(D)	(*)
	Forgings:				
346200	Iron and steel, 1,000 s tons	(S)	14.3	(S)	14.2
346310	Aluminum and aluminum-base alloy, mil lb	(S)	2.6	(S)	3.3
346326	Titanium and titanium-base alloy, do	(D)	(*)	(S)	6.3
346001	Other, do	(D)	(*)	(NA)	(*)
362112	Electric motors and generators, thousands	(D)	(*)	(NA)	(*)
	Bearings, including mounted and unmounted:				
356218	Ball	(X)	(*)	(X)	1.3
356201	Roller	(X)	(*)	(D)	(*)
339915	Metal powders, mil lb	**2.7	2.7	(D)	(*)
	Aerospace type fluid power parts and components:				
349235	Valves (hydraulic and pneumatic)	(X)	9.9	(X)	(*)
349291	Hose or tube fittings and assemblies (hydraulic and pneumatic)			(X)	9
359303	Cylinders and rotary activators (hydraulic and pneumatic)			(X)	(*)
359421	Pumps and motors (hydraulic)			(X)	2.4
220129	Broadwoven fabrics (cotton, wool, manmade fiber fabrics, etc.), mil lin yd	(S)	25.1	(D)	(*)
280020	Ceramic raw materials, including powders, chemicals, and fibers, excluding refractory uses	(X)	(*)	(X)	(*)
320901	Ceramic and ceramic composite parts, components, and accessories	(X)	-	(X)	(*)
345001	Bolts, nuts, screws, rivets, washers, and screw machine products	(X)	14.5	(X)	6.8
285101	Paints, varnishes, lacquers, shellacs, japans, enamels, and allied products, 1,000 gal	(S)	8.5	(D)	(*)
366302	Radio and electronic communication equipment, and navigation aids, airborne transmitters and receivers, radar, electronic-type fire control equipment, etc.	(X)	(*)	(X)	(*)
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic-type components	(X)	7.7	(X)	(*)
382711	Sighting, tracking, and fire control equipment, optical type	(X)	-	(X)	-
354501	Cutting tools for machine tools	(X)	5.5	(X)	4.0
342973	Aircraft metal hardware	(X)	(*)	(X)	(*)
381210	Aircraft flight instruments	(X)	-	(X)	-
362911	Aircraft engine instruments	(X)	-	(X)	-
372400	Aircraft engines	(X)	-	(X)	-
372440	Aircraft engine parts	(X)	-	(X)	-
372851	Aircraft propellers and parts thereof	(X)	-	(X)	-
372810	Aircraft parts, except engines and engine parts	(X)	-	(X)	(*)
376480	Guided missile and space vehicle engine parts	(X)	307.6	(X)	162.6
376920	Guided missile and space vehicle parts	(X)	113.7	(D)	(*)
970099	All other materials and components, parts, containers, and supplies	(X)	*548.6	(X)	* *323.7
971000	Materials, parts, containers, and supplies, n.s.k.[2]	(X)	41.4	(X)	100.0

See footnotes at end of table.

Table 3. **Materials Consumed by Kind: 1987 and 1982**—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material		1987		1982	
			Quantity[1]	Delivered cost (million dollars)	Quantity[1]	Delivered cost (million dollars)
	INDUSTRY 3769, SPACE VEHICLE EQUIPMENT, N.E.C.					
	Materials, parts, containers, and supplies		(X)	223.7	(X)	566.7
	Mill shapes and forms, except castings and forgings:					
	Carbon steel:					
331011	Bars and bar shapes	1,000 s tons	(S)	3	(S)	3
331012	Sheet and strip	do.	(S)	1	(S)	1
331013	Plates	do.	(S)	1	(D)	(*)
331015	Structural shapes	do.	(D)	(*)	(D)	(*)
331017	Wire and wire products	do.	(D)	(*)	-	-
331019	All other carbon steel mill shapes and forms	do.	(D)	(*)	(D)	(*)
	Alloy steel, except stainless:					
331021	Bars and bar shapes	1,000 s tons	(S)	1.1	(D)	(*)
331029	All other alloy steel mill shapes and forms	do.			(D)	(*)
	Stainless steel:					
331033	Sheet and strip	1,000 s tons	(S)	4	(Z)	(Z)
331050	All other stainless steel mill shapes and forms	do.	(S)	8	(D)	(*)
335105	Copper and copper-base alloy	mil lb	(D)	(*)	(D)	(*)
	Aluminum and aluminum-base alloy:					
335301	Sheet, plate, and foil	mil lb	(S)	5.2	(S)	2.3
335405	Extruded shapes, including extruded rod, bar, pipe, tube, etc.	do.	(S)	1.0	(D)	(*)
335008	All other aluminum mill shapes and forms (wire, rolled rod and bar, powder, welded tubing, etc.)	do.	(S)	7	*.2	6
335601	Titanium and titanium-base alloy	1,000 lb	(*)	1	-	-
335792	Copper insulated wire and cable (except magnet wire)	mil lb	(S)	3	(D)	(*)
	Castings (rough and semifinished):					
332011	Iron (gray and malleable)	1,000 s tons	(D)	(*)	(NA)	(*)
332045	Steel	do.	(D)	(*)	(S)	6
336005	Aluminum and aluminum-base alloy	mil lb	(S)	2.2	(S)	5
336003	Other nonferrous	do.	(D)	(*)	-	-
	Forgings:					
346200	Iron and steel	1,000 s tons	(D)	(*)	(S)	2.2
346310	Aluminum and aluminum-base alloy	mil lb	(S)	2.9	(S)	2.0
346326	Titanium and titanium-base alloy	do.	(D)	(*)	(S)	2.2
346001	Other	do.	-	-	(NA)	(*)
362112	Electric motors and generators	thousands	-	-	(D)	(*)
	Bearings (including mounted and unmounted):					
356218	Ball		(X)	(*)	(X)	-
356201	Roller		(X)	(*)	(X)	-
339915	Metal powders	mil lb	-	-	-	-
	Aerospace type fluid power parts and components:					
349235	Valves (hydraulic and pneumatic)		(X)	(*)	(X)	-
349261	Hose or tube fittings and assemblies (hydraulic and pneumatic)		(X)	(*)	(X)	(*)
359303	Cylinders and rotary actuators (hydraulic and pneumatic)		(X)	(*)	(X)	(*)
359421	Pumps and motors (hydraulic)		(X)	(*)	(X)	(*)
220129	Broadwoven fabrics (cotton, wool, manmade fiber fabrics, etc.)	mil lin yd	(X)	-	-	-
280020	Ceramic raw materials, including powders, chemicals, and fibers, excluding refractory uses		(X)	(*)	(X)	(*)
320601	Ceramic and ceramic composite parts, components, and accessories		(X)	(*)	(X)	(*)
345001	Bolts, nuts, screws, rivets, washers, and screw machine products		(X)	(*)	(X)	(*)
285101	Paints, varnishes, lacquers, shellacs, japans, enamels, and allied products	1,000 gal	(S)	2	(D)	(*)
366302	Radio and electronic communication equipment and navigation aids; airborne transmitters and receivers, radar, electronic-type fire control equipment, etc.		(X)	(*)	(X)	(*)
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic-type components		(X)	(*)	(X)	(*)
382711	Sighting, tracking, and fire control equipment, optical type		(X)	-	(X)	(*)
354501	Cutting tools for machine tools		(X)	6	(X)	(*)
342973	Aircraft metal hardware		(X)	(*)	(X)	(*)
381210	Aircraft flight instruments		(X)	-	(X)	-
382911	Aircraft engine instruments		(X)	-	(X)	-
372400	Aircraft engines		(X)	-	(X)	-
372440	Aircraft engine parts		(X)	-	(X)	-
372851	Aircraft propellers and parts thereof		(X)	-	(X)	-
372810	Aircraft parts, except engines and engine parts		(X)	-	(X)	(*)
376480	Guided missile and space vehicle engine parts		(X)	-	(X)	(*)
376920	Guided missile and space vehicle airframe parts		(X)	(*)	(X)	(*)
970099	All other materials and components, parts, containers, and supplies		(X)	[4]178.5	(X)	[4]461.2
971000	Materials, parts, containers, and supplies, n.s.k.[2]		(X)	29.3	(X)	94.7

[1]For some establishments, data have been estimated from central unit values which are based on quantity-cost relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated, ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

[2]Total cost of materials of establishments that did not report detailed materials data, including establishments that were not mailed a form.

[3]For 1987, material codes 331013, 331015, and 331017 are combined with material code 331019 to avoid disclosing data for individual companies.

[4]Data are included with material code 970099 to avoid disclosing data for individual companies.

[5]For 1982, material codes 332011, 346001, 280020, 320601, and 367004 were not collected separately but were included with material code 970099.

[6]For 1987, material code 346310 is combined with material code 346001 to avoid disclosing data for individual companies.

[7]For 1982, material code 372400 was not published separately but was included with material code 970099.

APPENDIX
Scope and Coverage and Explanation of Terms

GENERAL

The 1987 Census of Manufactures is the 32nd census of manufacturing establishments conducted in the United States. For 1987, it was conducted as part of the economic censuses, which included the censuses of mineral industries, construction industries, retail and wholesale trades, service industries, selected transportation activities, and minority-owned and women-owned businesses, under authority of title 13 of the United States Code. Title 13 specifies that an economic census be conducted every 5 years to cover years ending in 2 and 7.

SCOPE AND COVERAGE

Establishment Basis of Reporting

The census of manufactures is conducted on an establishment basis. All manufacturing establishments with one paid employee or more at any time during the year are covered by the census of manufactures. Therefore, a company operating at more than one location is required to file a separate report for each location. This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units which service manufacturing establishments of the same company. Where these auxiliary operations are conducted at the same location as the manufacturing operation, they are usually included in the report for the operating manufacturing establishment.

Use of Administrative Records

From a universe of approximately 350,000 manufacturing establishments in the 1987 Census of Manufactures, approximately 150,000 small single-establishment companies were excused from filing reports. Selection of the small establishment nonmail cases was done on an industry-by-industry basis. A variable cutoff was used to determine those establishments for which administrative records were to be used in place of a census report. The cutoffs were selected so the administrative-record cases would account for approximately 3 percent or less of the value of shipments for the industry. These cutoffs were then adjusted so that all single-establishment companies with less than 5 employees were excluded from the mail canvass, while all establishments with more than 20 employees were included. Where establishments in the 5 to 20 employee size range were included in the mail canvass, an abbreviated census form was frequently used.

For these nonmail establishments, (and a small number of larger establishment whose reports were not received at the time the data were tabulated) data on employment, payroll, and receipts were obtained from administrative records of other government agencies rather than from census forms. The administrative-record information was then used in conjunction with industry averages to estimate the data for these establishments. The value of shipments and cost of materials were not distributed among specific products and materials but were included in the product and material "not specified by kind" (n.s.k.) categories.

EXPLANATION OF TERMS

Number of establishments and companies–A separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

All employees–Includes all full-time and part-time employees on the payrolls at any time during the year. Included are all persons on paid sick leave, paid holidays, and paid vacations. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average of those for midmonth payroll periods of March, May, August, and November.

Production workers–Includes workers up through the working-supervisor level engaged in fabricating, processing, assembling, inspecting, receiving, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial, guard services, product development, auxiliary production for plant's own use (e.g., powerplant), recordkeeping, and other closely associated services. Truckdrivers delivering ready-mixed concrete are also included in production workers.

Other employees–Includes nonproduction personnel, including those engaged in the following activities: supervision above working-supervisor level, sales (including driver/salespersons), sales delivery (truckdrivers and helpers), advertising, credit collection, installation and

servicing of own product, clerical and routine office functions, executive, purchasing, finance, legal, personnel (including cafeteria, etc.), professional, and technical employees.

Payroll–Includes the gross earnings for the "employees" defined above, such as salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. Respondents were told that in reporting they could follow the definition of payrolls used for calculating the Federal withholding tax.

Production-worker hours–Covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave when the employee was not at the plant.

Cost of materials–Refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuels consumed, regardless of whether they were purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (a) all raw materials, semifinished goods, parts, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year; (b) electric energy purchased; (c) fuels consumed for heat, power, or generating electricity; (d) work done by others on materials or parts furnished by manufacturing establishments (contract work); and (e) products bought and resold in the same condition.

Specific materials consumed (table 3)–In addition to the total cost of materials which every establishment was required to report, information was also collected for most manufacturing industries on the consumption of major materials used in manufacturing. These inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Establishments consuming less than a specified amount (usually $10,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which administrative records were used was estimated as "not specified by kind" (n.s.k.).

Value of shipments and other receipts–Generally refers to received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts such as receipts for contract work performed for others, installation and repair receipts, sale of scrap, and sale of products bought and resold without further processing. Included are all items made by or for the establishment from materials owned by it whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In a few industries, the value of production or value of work completed is used instead of value of shipments. These industries are identified in the introduction and are footnoted in table 1.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, that is, including not only the direct costs of production but also a reasonable proportion of "all other costs" (including company overhead and profit).

Shipments or production of individual products (table 2)–In the 1987 census, detailed shipment information was collected for approximately 11,000 individual products. These products are identified by a seven-digit code and are grouped into approximately 1,500 classes of products, which in turn are primary to 459 four-digit industries. Data at the five-digit product-class level have been collected each year as part of the annual survey of manufactures. Information at the seven-digit level, collected for many industries in the current industrial reports program, is not included in this table.

Value added by manufacture–This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments for products manufactured plus receipts for services rendered. The result of this calculation is then adjusted by the addition of value added by merchandising operations (that is, the difference between the sales value and cost of merchandise sold without further manufacturing, processing, or assembly) plus the net change in finished goods and work-in-process inventories between the beginning and end of the year.

For those industries where value of production is collected instead of value of shipments (see footnote in table 1), value added is adjusted only for the change in work-in-process inventories between the beginning and end of the year. For those industries where value of work done is collected, the value added does not include an adjustment for the change in finished goods or work-in-process inventories.

Value added avoids the duplication in the figure for value of shipments which results from the use of products of some establishments as materials by others. Value

added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

Expenditures for new plant and equipment–Establishments in operation and any known plants under construction were asked to report their expenditures for (a) permanent additions and major alterations to manufacturing establishments and (b) new machinery and equipment used for replacement and additions to plant capacity if they are of the type for which depreciation accounts are ordinarily maintained.

These totals exclude expenditures for used plant and equipment, expenditures for land, and cost of maintenance and repairs charged as current operating expenses. Data for used plant and equipment will be published in the final industry bulletin.

End-of-year inventories–Comprised of (a) finished products; (b) work-in-process; and (c) materials, supplies, fuels, etc. Beginning in 1982, respondents were asked to report their inventories at (the lower of) cost or market prior to adjustment to LIFO cost. This is a change from prior years in which respondents were permitted to value their inventories using any generally accepted accounting method. Therefore, 1982 through 1987 data for inventories are not strictly comparable to prior-year data.

Specialization and coverage ratios–An establishment is classified in a particular industry if its shipments of primary products of the industry exceed in value its shipments of the products of any other single industry. An establishments' shipments include those products assigned to an industry (primary products), those considered primary to other industries (secondary products), and receipts for miscellaneous activities (merchandising, contract work, resales, etc.). The following ratios have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in table 1 and data on product shipments shown in table 2.

Specialization ratio–Represents the ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for the establishments classified in the industry.

Coverage ratio–Represents the ratio of primary products shipped by the establisnments classified in the industry to the total shipments of such products that are shipped by all manufacturing establishments, wherever classified.